PIER NOTES - APPLICATION

THE TEE PIERS SHOWN HERE WERE DESIGNED FOR USE WITH THE RS40-04 ROLLED STEEL BEAM BRIDGE STANDARDS. THE PIERS MAY BE USED FOR EITHER GRADE SEPARATION OR STREAM CROSSING STRUCTURES. THE PIERS WERE DESIGNED FOR THE FOLLOWING STREAM FORCE AND ICE LOADING CONDITIONS, AND SHOULD NOT BE USED WHERE THESE LOADING CONDITIONS ARE EXCEEDED.

ICE FORCE:
ICE FORCES WERE APPLIED AT A HEIGHT OF H/2 + 1'-6" ABOVE THE BOTTOM OF THE PIER FOOTING, WHERE H IS THE OVERALL HEIGHT OF PIER. THE ICE PRESSURE WAS 300 PSI FOR 1'-0" OF ICE DEPTH. THE PRIMARY ICE FORCE WAS ASSUMED TO ACT PARALLEL TO THE PIER'S LONG AXIS, WHILE 15% OF THIS FORCE WAS APPLIED PERPENDICULAR TO THE PIER'S LONG AXIS.

STREAM FLOW:
THE STREAM VELOCITY USED WAS 6 FT/SEC WITH THE K COEFFICIENT EQUAL TO 1.4. THE RESULTING STREAM FORCE WAS ASSUMED TO ACT PARALLEL TO THE PIER'S LONG AXIS. IT WAS ASSUMED THAT SUPERSTRUCTURE ELEMENTS WILL CLEAR HIGH WATER BY APPROXIMATELY 3'-0".

FOOTING GEOMETRY:
IT WAS ASSUMED THAT THE PIER FOOTING WILL BE SET APPROXIMATELY 6'-0" BELOW THE ADJACENT STREAMBED OR GROUND SURFACE. IT WAS ALSO ASSUMED THAT THERE ARE NO SIGNIFICANT UNBALANCED EARTH PRESSURES APPLIED TO THE PIER.

EACH BRIDGE DETAILED ON THESE STANDARDS WAS INTENDED TO HAVE ONE FIXED PIER AND ONE EXPANSION PIER. THE PILE LAYOUT AND REINFORCEMENT SHOWN ARE THE SAME FOR EITHER FIXED OR EXPANSION PIER, HAVING BEEN DESIGNED FOR THE GOVERNING LOAD ENVELOPE OF BOTH PIERS. THE ONLY DISTINCTION BETWEEN FIXED PIER AND EXPANSION PIER LIES IN THE SELECTION OF BEARINGS. EACH BRIDGE SHALL HAVE ONE SET OF SIX FIXED BEARINGS AND ONE SET OF SIX EXPANSION BEARINGS, WHICH MAY BE USED ON EITHER PIER 1 OR PIER 2.

HP10X42 STEEL PILES SHALL BE USED IN THE FOOTINGS OF THE PIERS. THE MAXIMUM ALLOWABLE STRESS FOR EACH PILE WAS TAKEN AS 6 KSI FOR EITHER THE FRICTION OR POINT BEARING PILE CONDITIONS. A MAXIMUM UPLIFT FORCE OF 10 K PER PILE WAS USED IN THE DESIGN OF THE PIER FOOTINGS. THE PIERS SHALL NOT BE USED AT SITES WHERE THIS UPLIFT FORCE CANNOT BE ACHIEVED DUE TO SPECIFIC CONDITIONS SUCH AS NEAR SURFACE ROCK LAYERS.

WHEN PIERS ARE USED IN GRADE SEPARATION STRUCTURES, EPOXY COATED REINFORCEMENT MAY BE REQUIRED FOR PIER COLUMNS. CONSULT CURRENT POLICY FOR GUIDANCE ON THE USE OF EPOXY COATED REINFORCEMENT IN SUCH CASES.

SUBSTRUCTURE - CONSTRUCTION

THE MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

Iowa Department of Transportation
Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

ROLLED STEEL BEAM BRIDGES

FEBRUARY, 2004

GENERAL NOTES
SHEET 2 OF 2

RS40-GD3-04